

What is claimed is:

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1. A system, comprising:

a data source, having a plurality of different lines;

5 a plurality of programmable delay elements, each coupled to one of said plurality of lines, to control a delay in said one of said lines to produce delayed values; and

a register, storing values for said programmable delay elements which respectively control an amount of delay caused by said delay elements.

10 2. A system as in claim 1, wherein there are one of said programmable delay elements for each of said plurality of lines.

15 3. A system as in claim 1, wherein said register stores a plurality of values, each of said plurality of values controlling one of said programmable delay elements.

20 4. A system as in claim 3, further comprising a non volatile memory, storing said plurality of values.

5. A system as in claim 1, further comprising an arbitration logic, coupled to said plurality of delayed

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values, and operating to determine relative timing of said plurality of lines.

6. A system as in claim 5, wherein said arbitration logic includes a first element which produces a set of first values for said register, and a second element which determines relative arrival of signals based on said first values.

7. A system as in claim 6, wherein said arbitration logic dithers between different sets of values, and determines which of said plurality of values produces best desired result, and stores said best result.

8. A system as in claim 1, further comprising a graphics device, and wherein said signals are from said graphics device.

9. A system as in claim 1, further comprising a non-volatile memory, storing values for said delay elements, and loading said values into said register at a specified time.

10. A system as in claim 8, further comprising arbitration logic, coupled to said plurality of delayed

values, dithers between different sets of values, determines which of said plurality of values produces a best desired result, and stores said best result in said non-volatile memory.

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Sub A1 11. A system as in claim 10, wherein said best result is one where the plurality of delayed signals are received at substantially the same time.

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12. A system as in claim 10, wherein said best result is one where the plurality of delayed signals are received at a time skew that allows certain logic elements to operate correctly.

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13. An electronic device, comprising:

a first device producing a plurality of first outputs;

a plurality of programmable delay elements, each of said plurality of programmable delay elements connected at one end to one of said plurality of outputs and each producing a

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second output which is delayed relative to said first outputs;

a levelization register, storing a plurality of values, said values each individually controlling one of said delay elements to control an amount of delay caused by said delay element to one of said plurality of outputs.

14. A device as in claim 13, further comprising arbitration logic, connected to each of said second outputs, and determining a relative delay among said second outputs.

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15. A device as in claim 14, wherein said arbitration logic is responsive to a system event flag, which indicates a specified event in the system.

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10 16. A device as in claim 15, wherein said specified event is a hardware change.

15 17. A device as in claim 15, wherein said specified event is a system crash.

20 18. A system as in claim 15, wherein said arbitration logic is responsive to said flag to produce a first set of values for said levelization register, command said first device to produce said signals, and determine a relative delay among said signals based on said first set of values.

19. A system as in claim 14, further comprising a non volatile memory which stores levelization values, said

arbitration logic storing said levelization values in said non
volatile memory.

20. A system as in claim 15, further comprising, at
5 initial system start up, downloading values from said non
volatile memory to said levelization register.

21. A system as in claim 15, wherein said programmable
delay elements are phase locked loops.

22. A method comprising:
receiving a plurality of signals from an external device,
each of said plurality of signals related to each other; and
programmably delaying some of said signals relative to
15 others of said signals according to prestored values.

23. A method as in claim 22, wherein plurality of
signals are signals from a bus.

24. A method as in claim 23, wherein said plurality of
signals are signals from a graphics bus.

25. A method as in claim 22, wherein said delaying
comprises storing delay values in a non volatile memory; and

using said values in said non volatile memory to adjust a value of a programmable delay element.

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26²⁶ 25. A method as in claim 24²⁵, further comprising
5 determining if a system event has occurred, and storing new
delay values in said non volatile memory responsive to said
system event occurring.

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10 27²⁷ 26. A method as in claim 25²⁶, wherein said system event
is a change in system hardware configuration.

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28²⁸ 28²⁸ 27. A method as in claim 26²⁶, wherein said system event
is a system crash.

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15 29²⁹ 28. A method as in claim 27²⁸, wherein said reobtaining
comprises dithering values in a register that stores values
for said programmable delay, determining results, and
accepting values which have produced a specified delay.

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20 30²⁹ 29. A method as in claim 28²⁹, further comprising storing
said values in said non-volatile memory.

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31 ~~30~~. A method as in claim ~~28~~²⁹, wherein said specified delay is a result where there is a minimal delay between arrival of all signals.

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5 ~~32~~³¹. A method as in claim ~~28~~²⁹, wherein said specified delay is a result where there is a specified delay between arrival of all signals which allows for clock skew in at least one specified logic element.

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10 ~~33~~³². A method of equalizing time delays of signals, comprising:

providing a plurality of signals which are produced in times that are synchronized with one another;

delaying each of said plurality of signals by a
15 respective amount, wherein each of said respective amounts is different then each other respective amount for a different one of said signals;

testing said signals, to determine relative amounts of delays in said signals, to produce said delay amount; and

20 using said delay amounts to delay said signals.

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~~34~~³³. A method as in claim ~~32~~³³, wherein said plurality of signals are signals from a graphics processing device.

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35 ~~34~~. A method as in claim ~~32~~³³, wherein said delaying comprises delaying each of the signals by respective amounts which causes them to arrive at a specified location at substantially similar times.

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36 ~~35~~. A method as in claim ~~32~~³³, wherein said delaying comprises delaying said signals by specified amounts which causes them to arrive at said location at specified times which are skewed relative to one another, wherein said skew is related to a clock margin of a system.

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37 ~~36~~. A method of setting delays in a system, comprising:
storing values indicative of time delays in a register,
said time delays representing delays to be applied to signals
to obtain a specified result;

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detecting a system event which indicates that said time
delays should be changed;

when said event is not detected, using said values in
said register to cause signal delays, by applying said values
to respective programmable delay elements; and

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when said event is detected, using a logic element to
determine new delay values and applying said new delay values
to said programmable delay elements to cause signal delays
based on said new delay values.

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38. A method as in claim ³⁷~~36~~, wherein said using comprises applying a plurality of delay values to a plurality of respective programmable delay elements to thereby delay a plurality of lines.

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39. A method as in claim ³⁷~~36~~, further comprising storing said new delay values in a non-volatile memory.

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40. A method as in claim ³⁷~~36~~, wherein said system event includes a change of system components.

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41. A method as in claim ³⁷~~36~~, wherein said system event is an operating system crash.

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42. A method, comprising:
receiving a plurality of signals in parallel from a specified device, which signals are produced at substantially synchronized times;

applying said plurality of said signals to programmable delay devices which allow individual delay of said signals;
and

controlling said plurality of programmable delay devices to allow the signals to arrive to at least one specified location in a specified way.

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43 42. A method as in claim 41, wherein said specified way
is that said signals are substantially synchronized with one
another at said at least one specified location.

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5 44 43. A method as in claim 41, wherein said specified way
is that said signals are have a specified relationship to one
another at said at least one specified location, which
specified relationship is not synchronized, to allow a system
to work properly.

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45 44. A method as in claim 41, further comprising storing
said information in a non-volatile memory.

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